

Research on the influence of RPA technology on enterprise risk management —— Take Western Securities as an example

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Abstract. Robotic Process Automation (RPA) technology is non-intrusive and operates without time restriction. It has been widely adopted in financial processes across industries. Meanwhile, securities companies play a core role in fund flows and manage sensitive data, making risk management crucial for them. This study focuses on the practical value of RPA technology in risk management within the securities industry. Through literature research and case analysis, this study compares the efficiency and effectiveness of risk management before and after applying RPA technology in Western Securities Company. The study reveals that RPA technology mainly has three functions: risk prediction and identification, strategy formulation, and continuous monitoring. Western Securities built a "data foundation + data model" structure to integrate data from multiple business platforms. Besides, the company adopted an "RPA + AI" fusion model for real-time monitoring and analysis across systems. RPA technology has the characteristics of 7×24-hour automatic operation, which saves 375 hours for each person per month and dramatically improves the anti-risk ability. Western Securities needs to strengthen data encryption and real-time monitoring to maintain data and network security. Besides, the company should pay attention to training employees to use and design financial robots and reserve funds to deal with operation problems. In the future, the government will strengthen the legal supervision of digital technologies. The intelligent automation of enterprise risk management will combine RPA with more digital technologies and comprehensively improve the risk prevention ability.

Keywords: RPA technology; risk management; securities industry.

1. Introduction

In recent years, with continuous changes in the economic situation, national macroeconomic policies have continued to update, and the international financial market is constantly changing. The Central Financial Work Conference pointed out that risk prevention and control should be taken as the eternal theme of economic work. For securities companies, risk management is helpful in maintaining good market order, protecting the interests of investors, and enhancing the corporate image. Therefore, the security industry should pay close attention to how to do a good job in risk management. The research shows that the risk management difficulties faced by securities companies in the current society have many certain commonalities, such as companies cannot identify the increasingly complex business risks immediately; the accuracy, completeness, and timeliness of data are difficult to be guaranteed due to data silos and process breakpoints. The workflow of risk management is very long and complex, and there is a lot of repetitive work, which leads to high labor costs. The existence of these problems limits the efficiency of risk management of securities companies to a great extent and also provides an excellent research space for this study. It is found that RPA technology plays an extremely important role in solving the above problems. For example, RPA can automatically perform a large number of tasks with high repeatability and a high manual error rate; RPA technology can be seamlessly integrated with other systems to effectively break departmental barriers and data islands. In addition, RPA can also realize real-time monitoring and reporting of business processes.

This paper can be roughly divided into three parts. The first part is to sort out the relevant research background, including social background, industry background, and technical background. Secondly, the domestic and foreign literature are fully studied and analyzed to clarify the risk management problems that can be solved by RPA technology in the securities industry. Therefore, by comparison, Western Securities Co., LTD., which is successful in digital transformation and has certain typical characteristics in the industry, is selected as the case study. The second part is the use of the case study method, targeted to the above problems in-depth analysis. The last part is to draw the research conclusion and enlightenment through the above analysis and provide some suggestions for the future development of the Western securities and securities industry.

2. Literature Review

2.1. Application Scenarios of RPA in Risk Management

Wang Wen et al. highlight key challenges in the securities industry's risk management transformation: insufficient data integration degree, limited automation, and so on. Their proposed "two-wheel drive" strategy combines a bottom data market with an upper intelligent application. This approach emphasizes that technical upgrades are critical for driving business digitization[1].

KPMG pointed out that 71% of enterprises have applied AI to the financial field. It is mainly used in research and data analysis, fraud identification and prevention, predictive analysis and planning, etc [2]. And the application rate of risk management is close to 50%. Jinyuan et al. proposed four situations of financial RPA, including cross-platform data transmission, repetitive operation, complex logical data processing, and human-computer cooperation [3]. Domestic literature is inclined to explore the role of RPA on the framework of corporate finance and regards risk management as a part of the framework. Zhang Limin and Bi Ying built a carbon finance system based on "Chatgpt +RPA" technology. It can be applied to the analysis and learning of historical data, the analysis of carbon risk sentiment indicators, the generation of risk trend reports, etc. As a result, the system could achieve carbon risk prediction, risk outlook analysis, risk sentiment analysis, and automatic error correction [4]. Kothandapani HP discussed the application scenarios of RPA in financial risk management, including market risk, credit risk, and operational compliance risk. RPA plays a key role in complex scenario simulation, compliance monitoring, and real-time risk reporting through automated data collection, model execution, and result analysis. So, RPA technology helps financial institutions achieve efficient and accurate risk management [5].

In domestic and foreign literature, there are differences and connections between the application scenarios of RPA in the field of risk management. For the domestic literature, the application of RPA is mainly concentrated in the financial industry, and there are few application cases in other industries. While foreign literature reflects a broader industry coverage. The same is that they both emphasize process standardization and human error reduction through RPA, and rely on rule-driven automation.

In the future, both domestic and foreign literature will tend to the deep integration of RPA and AI, and the expansion of cross-industry application scenarios. Domestic RPA technology will pay more attention to reducing costs and lowering the application threshold to meet the requests of small and medium-sized enterprises. In addition, data security and ethical risk management also need to be strengthened.

2.2. Effect of RPA in Risk Management

Jinyuan et al. also proposed the effects of efficiency improvement, including data integration, process optimization, work efficiency enhancement, human error reduction, etc [3]. Daniel Durão argues that the utilization of RPA technology in corporate internal business processes can substantially reduce human error rates while enhancing operational efficiency and service quality. RPA adoption demonstrates measurable improvements in consumer satisfaction and relationship management [6]. Aleksandr Nechiporenko proposed that RPA financial management systems achieve critical outcomes: positive return on investment (ROI), achieved revenue and expenditure balance,

and enhanced cost optimization [7]. Onyeka Franca Asuzu et al. Concluded through a literature review that RPA can enable accountants to focus on strategic and analytical roles by automating daily tasks and improving operational efficiency. The integration of RPA significantly improves the accuracy, efficiency, and compliance of accounting processes [8]. Bernhard Axmann et al. Proposed four major advantages of using RPA. Firstly, it improves economic performance and avoids the risk of financial loss and high costs. Secondly, it reduces the possibility of business process errors. Besides, through applying the RPA system, the enthusiasm of employees has been improved. Finally, RPA's learning and development function realizes digitalization, and transparency, and reduces network security risks [9].

Some scholars are concerned about the risk of RPA applied to the enterprise financial system. Jinyuan et al. analyzed the implementation risk of RPA in demand discovery, development, operation, and performance evaluation, each link in the process [10]. Al Zarooni L. and El Khatib M. pointed out that although RPA improves efficiency in project risk management, it also brings new risks and challenges. Such as the risk of misconfiguration, system interruption, and data security caused by improper allocation of cross-departmental collaboration permissions. The study emphasizes that RPA needs to combine precise process screening, technology governance, and emergency plans to maximize benefits and control technology dependence risks [11].

At present, most of the research on RPA are case studies or literature reviews, focusing on the advantages and disadvantages of using RPA in enterprise finance and business processes. There are still some gaps in how RPA identifies, controls, and monitors enterprise risks. This research will cite the case of Western Securities to analyze the effect of RPA technology in the financial field and its application in risk management.

3. RPA technology application example in the Western Securities

3.1. Introduction to Western Securities & Background of Using RPA Technology

Western Securities Co., Ltd. was established in January 2001, registered in Xi 'an, Shaanxi Province, with a registered capital of 4.469 billion yuan, and the actual controller is Shaanxi Investment Group Co., LTD. On May 3, 2012, the company's first A-share shares were listed on the Shenzhen Stock Exchange, making it the 19th securities company listed in China. Since its establishment more than 20 years ago, Western Securities has been based in Shaanxi, serving the whole country, giving full play to the bridge role of financial enterprises, serving the development of the real economy, helping the country to overcome poverty, and practicing corporate social responsibility.

Because many business processes such as data entry, report generation, contract review, and so on in the securities industry have the characteristics of strong repeatability and clear rules, the business of Western Securities involves multiple systems and cannot realize data interaction and operation across systems, resulting in solving data islands and other problems. To quickly process a large number of data and files, improve the speed of business processing, liberate employees from low-end data operations, so that they can focus on more valuable work, improve data consistency and accessibility, realize seamless integration of business data and existing IT systems, and promote smoother collaboration between different systems. So, Western Securities believes that the use of RPA technology will achieve the above goals.

3.2. Application Example of RPA in Western Securities

The Unified Risk Management Platform is a full-coverage risk platform based on self-support investment, market making, and wealth credit. It has realized functions such as real-time marking to market, stress testing, and regulatory statements, as well as landing risk identification, monitoring, and early warning systems. It saves labor costs using platform extension, automatic report generation, and other functions through digital employees. The configurable index engine simplifies the index

configuration process and index logic update, and the company's risk index system improves the timeliness and work efficiency of risk management.

The new generation data management service system "Shumu Platform" builds ten reusable system functions based on the company's data assets, and constructs three platform capabilities of "viewing, managing and using". It serves six types of user groups and meets seven core application scenarios. It is an efficient and stable data asset management service system. Its functions can satisfy the data requirements of various scenarios and improve the utilization rate of data assets. Through investment and research system tools to solve the external financial data terminal cannot connect with the company's data and other pain points, improve work efficiency; Data Governance - Anti-money Laundering checks, corrects, and tracks defective data to prevent business risks effectively.

VSignals value signal decision-making system integrates cutting-edge technologies such as big data and artificial intelligence, standardizes, instruments, and modularized investment research process, after that, it launches company overview, performance exceeded expectations, conditional stock selection, index & strategy, institutional research, alternative data, home page of individual stocks and so on. Through each module to capture the overall changes in the market in time, extensive tracking of characteristic data, etc., to provide customers with personalized one-stop solutions, increase the total number of customers, and improve work efficiency.

The R&D and operation integration platform is based on cloud-native technology, realizes the unified management of R&D assets, and employs standardized R&D specifications and operation processes into the platform. Through the whole link research and development, data quality, and the effect of measurement to promote mutual cooperation and digital products of high-quality delivery.

In conclusion, Western Securities uses RPA technology to build all kinds of platforms to promote the digital transformation of enterprises, implement the relevant personnel, improve working efficiency, human cost reduction, business process automation, etc. According to the data, as of May 2023, the digital employee project has launched nearly 60 processes, covering the total operation time of robots in 9 business departments of 3,500 hours, saving about 437 man-days, and the success rate of most processes is maintained at more than 90%, ensuring the stable operation of daily processes. Series 29 systems to solve part of the data island problem. Since the RPA platforms were put into use in 2022, according to the 2023 financial report, due to the acceleration of IT construction, futures trading volume increased by 10.80% year-on-year, and the average daily equity scale of customers basically remained stable.

In addition, by comparing the financial reports of Western Securities from 2020 to 2023, the following line Figure (Figure 1) is obtained. Figure 1 shows that the net profit of its main holding and participating companies increased significantly when RPA technology was developed in 2021. After RPA technology was officially used in 2022, the net profit of its main holding and participating companies increased significantly again.



Figure 1. Net profit trend of major holding and shareholding companies.
(Data source: Financial report of Western Securities from 2020 to 2023)

This shows that RPA platforms not only save labor costs for Western Securities but also increase the number of customers and operating income, bringing higher economic benefits to enterprises.

4. The Impact of RPA Technology on Enterprise Risk Management System

Western Securities began to build digital employees in December 2021, experienced a construction period of 2022, and has seen results in 2023, winning many awards. Under the effective risk management system, the operating income of Western securities in 2023 reached 6.894 billion yuan, an increase of 29.87% compared with 2022, reaching a peak in 2019-2023. In 2023, the net profit index reached 1.166 billion, an increase of 160.21%. The following section will discuss the effect of RPA technology on different links in risk management systems.

4.1. Enterprise Risk Prediction and Identification

To establish a perfect risk system to effectively deal with risks, the first step that enterprises need to do is to predict possible risks and identify potential risks through data. Due to the advent and development of the current information age of big data, many challenges have been added to the data collection and risk analysis of enterprises. The data sources of enterprises have become complex and diverse, requiring detailed classification and screening; Under the condition of a large base, the quality of the data also becomes uneven. The application of RPA technology will effectively solve these difficulties in risk identification, reduce the cost of human and material resources, and make accurate judgments and prediction results.

Western Securities has established the business architecture and digital architecture of risk management respectively to realize the data collection and the intelligent data processing capability of RPA. First of all, in terms of business structure, Western Securities pays attention to market information in real-time and establishes a complete and comprehensive "database + data model" to cover the data of multiple platforms such as Hang Seng UF20 and Sinovel Superspeed trading platform.

After completing the basic data information collection in the business architecture, Western Securities uses RPA digital employees in the digital architecture to realize centralized cleaning and unified integration of scattered upstream data and adopts non-intrusive data collection services to improve the overall data quality and scope.

4.2. Scientific Response to Enterprise Risk Management

4.2.1. Pool platform data in real time to maintain timeliness of management

In financial risk management, it is necessary to maintain the timeliness of risk assessment to prioritize its occurrence probability and scale, to help enterprises make corresponding risk response measures. In the traditional mode, this process requires a lot of time and money, and the error rate of manual prevention process measures is high and has a certain lag.

Western Securities uses RPA to replace this tedious manual work with a high repetition rate, significantly improving the efficiency of risk management and reducing human errors. The processing mode of "RPA + AI" can also enable RPA to open the underlying data to achieve cross-system data integration, greatly enhancing the risk control ability and timeliness of Western Securities under the coordination of dual-sided functions.

4.2.2. Deep data mining, maintain high adaptability

With the support of RPA's powerful capacity of collecting and recording data, companies can establish a long-term and stable financial process data number of passes to improve their financial data flexibility and resilience.

By using RPA in the daily financial process, Xibu Securities can generate detailed financial data reports, to maintain a high degree of data fit. The accuracy and consistency of data in various systems,

especially in the financial industry of Western Securities, comprehensive data sharing, and RPA automated data recording can ensure that financial processes are carried out within legal limits.

4.3. Ongoing monitoring in enterprise risk management

Compared with ordinary manual work, RPA can complete more tasks in a shorter time and can work continuously 24 hours a day. Based on the above characteristics, RPA technology can implement real-time and regular detection and monitoring of corporate financial risks, and prevent corporate risks.

The implementation of RPA technology in Western Securities has improved the systematic support capacity of risk management, established a variety of data models for automatic calculation, and significantly improved the efficiency of risk management. According to the report of zhitong.com, as of the end of 2022, the digital employee project of Western Securities has accumulated 49 online processes covering 9 business processes, with a total operation time of 2974 hours and monthly saving of 375 person-days. According to Western Securities' annual report for 2023, the company's continuous investment in digitalization has greatly reduced its dependence on the external environment and improved the company's ability to resist risks and cyclones. Western Securities' unified and comprehensive financial services platform has become one of the company's key core competencies. In summary, the use of digital employees has greatly reduced labor consumption, established an effective risk management platform framework, and greatly promoted Western Securities' digital transformation.

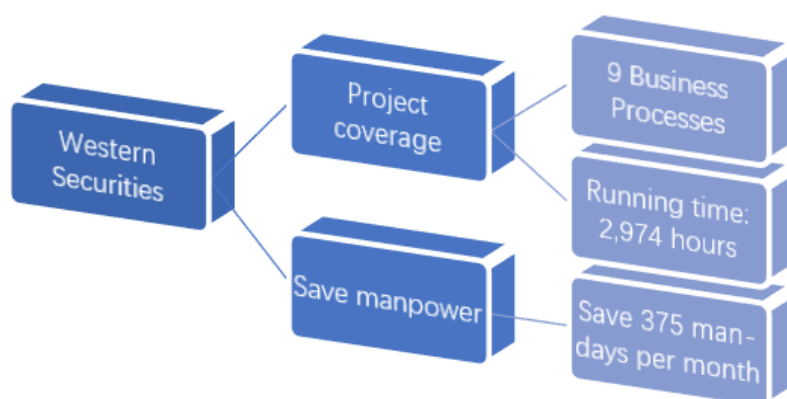


Figure 2. Western Securities RPA project cumulative savings efficiency Figure.

5. Conclusion

This paper takes the enterprise Xibu Securities as the case of using RPA, mainly from its financial process and risk management two major aspects of the discussion. Meanwhile, this paper uses a case-study approach by collecting online literature and internal annual reports and news from enterprises. After comparing the effectiveness of RPA technology in the business system and risk management of Western Securities, it was concluded that RPA played an indispensable role in the digital transformation of Western Securities. However, this article also has some shortcomings. There is still a lack of scientific methods and a large amount of data support for the application of RPA technology in Western Securities, and there is no definite conclusion as to whether RPA can be widely promoted to help other enterprises solve problems through this case.

By presenting examples of the use of RPA technology in Western securities, the main purpose of this paper is to provide companies in other financial industries with feasible ideas to greatly simplify financial business processes and improve their risk management capabilities. In the future, RPA is expected to be combined with more advanced technologies (such as AI, big data, etc.) to form a more intelligent and efficient risk management system, thus helping enterprises in the financial industry and other industries to release market vitality, adapt to the needs of the times, and realize digital transformation.

Authors Contribution

All the authors contributed equally and their names were listed in alphabetical order.

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